EXPERIMENTAL CELL RESEARCH

EDITOR-IN-CHIEF
N. RINGERTZ

ASSISTANT EDITOR
S. ERIKSSON

EDITORS
R. APPELS · R. BASERGA · H. M. BLAU · M. BUSTIN · B. CANNON · E. DE ROBERTIS
D. EPEL · W. C. EARNSHAW · S. FAKAN · W. W. FRANKE · S. J. KAUFMAN
N. LE DOUARIN · G. MAGNUSSON · D. MAZIA · M. MCBURNEY
J. MELDOLESI · G. L. NICOLSON · B. ÖBRINK · I. PASTAN · R. ROSS · E. ROZENGURT
F. H. RUDDLE · R. SAGER · U. SCHEER · R. TIMPL · K. WEBER · A. M. ZIMMERMAN

FOUNDING EDITORS
T. CASPERSSON and J. RUNNSTRÖM

VOLUME 184 · 1989

ACADEMIC PRESS, INC.
Harcourt Brace Jovanovich, Publishers
San Diego New York Boston
London Sydney Tokyo Toronto

COPYRIGHT © 1989 BY ACADEMIC PRESS, INC.

All Rights Reserved

No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopy, recording, or any information storage and retrieval system, without permission in writing from the copyright owner.

The appearance of the code at the bottom of the first page of an article in this journal indicates the copyright owner's consent that copies of the article may be made for personal or internal use, or for the personal or internal use of specific clients. This consent is given on the condition, however, that the copier pay the stated per copy fee through the Copyright Clearance Center, Inc. (27 Congress Street, Salem, Massachusetts 01970), for copying beyond that permitted by Sections 107 or 108 of the U.S. Copyright Law. This consent does not extend to other kinds of copying, such as copying for general distribution, for advertising or promotional purposes, for creating new collective works, or for resale. Copy fees for pre-1989 articles are as shown on the article title pages; if no fee code appears on the title page, the copy fee is the same as for current articles.

0014-4827/89 $3.00

Printed in Sweden by

Almqvist & Wiksell Tryckeri, Uppsala 1989

CONTENTS OF VOLUME 184

NUMBER 1, SEPTEMBER 1989

REGULAR ARTICLES

TADAL CHATTERJEE, NORA V. HIRSCHLER, SHIRLEY J. PETZOLD, SOSAMMA J. BERGER, AND NATHAN A. BERGER. Mutant Cells Defective in Poly(ADP-ribose) Synthesis due to Stable Alterations in Enzyme Activity or Substrate Availability 1

HN H. STODDART, MARY ANN LANE, AND RICHARD M. NILES. Sodium Butyrate Suppresses the Transforming Activity of an Activated N-*ras* Oncogene in Human Colon Carcinoma Cells 16

BIKFALVI, J. ENOUF, R. BREDOUX, A. LOMPRE, E. DUPUY, N. BOURDEAU, S. LEVY-TOLEDANO, AND G. TOBELEM. Evidence of Endoplasmic Reticulum-Related Ca^{2+} ATPase in Human Microvascular Endothelial Cells 28

OHAMED M. HAFEZ AND MARK E. COSTLOW. Phosphatidylethanolamine Turnover Is an Early Event in the Response of NB_2 Lymphoma Cells to Prolactin 37

GNES SÓOKI-TÓTH, GÁSPÁR BÁNFALVI, JÁNOS SZÖLLÖSI, EVA KIRSTEN, MARIA STAUB, FERENC ANTONI, AND ERNEST KUN. Cellular Regulation of ADP-Ribosylation of Proteins. III. Selective Augmentation of *in Vitro* ADP-Ribosylation of Histone H3 in Murine Thymic Cells after *in Vivo* Emetine Treatment 44

LL DIAMOND, HOWARD CEDAR, AND MENASHE MARCUS. A Temperature-Sensitive Mutation in Asparaginyl-tRNA Synthetase Causes Cell-Cycle Arrest in Early S Phase 53

WACHTLER, M. HARTUNG, M. DEVICTOR, J. WIEGANT, A. STAHL, AND H. G. SCHWARZACHER. Ribosomal DNA Is Located and Transcribed in the Dense Fibrillar Component of Human Sertoli Cell Nucleoli 61

OMENICO BOSCO, LELIO ORCI, AND PAOLO MEDA. Homologous but Not Heterologous Contact Increases the Insulin Secretion of Individual Pancreatic B-Cells 72

AN RAŠKA, KAREL KOBERNA, MICHAL JARNÍK, VALÉRIA PETRAŠOVIČOVÁ, JAN BEDNÁR, KAREL RAŠKA, JR., AND RODRIGO BRAVO. Ultrastructural Immunolocalization of Cyclin/PCNA in Synchronized 3T3 Cells 81

ROTOMO YAMADA, SHINJI KOIZUMI, MASAMI KIMURA, AND NOBUYOSHI SHIMIZU. Reduction of EGF Receptor Levels in Human Tumor Cells Transfected with an Antisense RNA Expression Vector 90

C. SCHLICHTER AND I. C. MACCOUBREY. Interactive Effects of Na and K in Killing by Human Natural Killer Cells 99

RRY W. SHAY AND WOODRING E. WRIGHT. Quantitation of the Frequency of Immortalization of Normal Human Diploid Fibroblasts by SV40 Large T-Antigen 109

JAINE R. JACKOLA AND JAMES J. O'LEARY. Monocyte Requirement for Mitogen-Induced Aggregation of Human Peripheral Mononuclear Leukocytes *in Vitro* 119

DAVIDE TRERÈ, ANNALISA PESSION, AND MASSIMO DERENZINI. The Silver-Stained Proteins of Interphasic Nucleolar Organizer Regions as a Parameter of Cell Duplication Rate 131

MICHAEL D. WEST, OLIVIA M. PEREIRA-SMITH, AND JAMES R. SMITH. Replicative Senescence of Human Skin Fibroblasts Correlates with a Loss of Regulation and Overexpression of Collagenase Activity 138

TOSHIHARU MATSUMURA, JACQUELINE L. HUNTER, MALIK FAROOQ, AND ROBIN HOLLIDAY. Maintenance of DNA Methylation Level in SV40-Infected Human Fibroblasts during Their *in Vitro* Limited Proliferative Life Span 148

M. CORRAL, B. PARIS, G. BAFFET, L. TICHONICKY, C. GUGUEN-GUILLOUZO, J. KRUH, AND N. DEFER. Increased Level of the Mitochondrial ND5 Transcript in Chemically Induced Rat Hepatomas 158

KATHY A. SUPRENANT. Alkaline pH Favors Microtubule Self-Assembly in Surf Clam, *Spisula solidissima*, Oocyte Extracts 167

YNGVE SOMMARIN, THOMAS LARSSON, AND DICK HEINEGÅRD. Chondrocyte–Matrix Interactions. Attachment to Proteins Isolated from Cartilage 181

JÜRGEN SCHWEIZER, INES BAUST, AND HERMELITA WINTER. Identification of Murine Type I Keratin 9 (73 kDa) and Its Immunolocalization in Neonatal and Adult Mouse Foot Sole Epidermis 193

PATRICE MAUREL, LYDIE GUALANDRIS-PARISOT, JUSTIN TEISSIÉ, AND ANNE-MARIE DUPRAT. Electric-Field-Induced Permeabilization and Fusion of Embryonic Amphibian Cells 207

KEN-ICHI MIYAMOTO, FUJIKO SANAE, RYOZO KOSHIURA, TAKAYUKI MATSUNAGA, TAKAAKI HASEGAWA, KENZO TAKAGI, AND TATSUO SATAKE. Forskolin Inhibits the Gs-Stimulated Adenylate Cyclase in Rat Ascites Hepatoma AH66F Cells 219

SHORT NOTES

A. S. GLEIBERMAN, YU. YU. SHAROVSKAYA, AND L. M. CHAILAKHJAN. "Contact Inhibition" of α-Fetoprotein Synthesis and Junctional Communication in Adult Mouse Hepatocyte Culture 228

L. DINI AND V. KOLB-BACHOFEN. Preclustered Receptor Arrangement Is a Prerequisite for Galactose-Specific Clearance of Large Particulate Ligands in Rat Liver 235

M. L. SOBRIER, S. CHAPEL, J. L. COUDERC, D. MICARD, P. LECHER, G. SOMME-MARTIN, AND B. DASTUGUE. 20-OH-Ecdysone Regulates 60 C β Tubulin Gene Expression in Kc Cells and during *Drosophila* Development 241

RONALD E. WORTHINGTON. Calcium Response to Erythropoietin in Erythroleukemia Cells . . . 250

MARIO HOUDE, ROBERT J. SHMOOKLER REIS, AND SAMUEL GOLDSTEIN. Proportions of H1 Histone Subspecies in Human Fibroblasts Shift during Density-Dependent Growth Arrest Independent of Replicative Senescence 256

A. D. Kidd, D. Francis, and M. D. Bennett. Replicon Size and Rate of DNA Replication Fork Movement Are Correlated in Grasses . . 262

K. Kuroda and N. Kamiya. Propulsive Force of *Paramecium* as Revealed by the Video Centrifuge Microscope . . . . . .

NUMBER 2, OCTOBER 1989

REVIEW

Jacqueline Hayles and Paul Nurse. A Review of Mitosis in the Fission Yeast *Schizosaccharomyces pombe* 273

REGULAR ARTICLES

Roberto Campos-Gonzalez, Martha Kanemitsu, and Alton L. Boynton. Tumor Promoter-Dependent Phosphorylation of a Triton X-100 Extractable Form of Lipocortin I in T51B Rat Liver Cells 287

Laurel M. Donahue and Gretchen H. Stein. Coordinate Control of Growth Arrest States in Normal Human Diploid Fibroblasts: Effect of Cloned SV40 Tumor Antigen Genes 297

Peter Morrison and Linda J. Lowe-Krentz. Heparin Induces Changes in the Synthesis of Porcine Aortic Endothelial Cell Heparan Sulfate Proteoglycans 304

N. W. Williams and D. Wynford-Thomas. Oncoprotein p53 Expression in Normal, Immortalized, and Transformed Mouse Fibroblasts 316

Lucien Frappart, Marie-France Lefebvre, and Simone Saez. The Effect of 1.25 Dihydroxyvitamin D_3 on Binding and Internalization of Epidermal Growth Factor in Cultured Cells. Studies on BT-20 Cells Using Quantitative Electron Microscope Autoradiography 329

O. Yu. Printseva, A. V. Tjurmin, S. A. Rudchenko, and V. S. Repin. Noradrenaline Induces the Polyploidization of Smooth Muscle Cells: The Synergism of Second Messengers 342

Seiichi Hashimoto and Akihiko Hagino. Staurosporine-Induced Neurite Outgrowth in PC12h Cells 351

Joachim Vetter and Heinrich Betz. Expression of Synaptophysin in the Rat Pheochromocytoma Cell Line PC12 360

Giuliano Callaini and Daniela Marchini. Abnormal Centrosomes in Cold-Treated *Drosophila* Embryos 367

Jeffrey M. Cheek, Michael J. Evans, and Edward D. Crandall. Type I Cell-like Morphology in Tight Alveolar Epithelial Monolayers 375

Jukka Tienari. Actin Cytoskeleton of Extraembryonic Endoderm and Teratocarcinoma-Derived Endoderm Cells 388

Gabriele Jaques, Paul Kiefer, Martin Rotsch, Cordula Hennig, Rüdiger Göke, Gerd Richter, and Klaus Havemann. Production of Insulin-like Growth Factor Binding Proteins by Small-Cell Lung Cancer Cell Lines 396

Thomas J. Raub and Sandra L. Kuentzel. Kinetic and Morphological Evidence for Endocytosis of Mammalian Cell Integrin Receptors by Using an Anti-fibronectin Receptor β Subunit Monoclonal Antibody . . . . . .

Sjerp M. Weima, Let H. Stet, Marga A. van Rooijen, Sylvia C. van Buul-Offers, Everardus J. J. van Zoelen, Siegfried W. de Laat, and Christine L. Mummery. Human Teratocarcinoma Cells Express Functional Insulin-like Growth Factor I Receptors . . . . . .

Toshimichi Yoshida, Koji Katsuta, Hideki Takanari, and Kosaku Izutsu. Analysis of Mammalian Dynein Using Antibodies against A Polypeptides of Sea Urchin Sperm Flagellar Dynein . . . . . .

J. Lindemans, A. C. M. Kroes, J. v. Geel, J. van Kapel, M. Schoester, and J. Abels. Uptake of Transcobalamin II-Bound Cobalamin by HL-60 Cells: Effects of Differentiation Induction . . .

Narendra P. Singh, David B. Danner, Raymond R. Tice, Michael T. McCoy, Gary D. Collins, and Edward L. Schneider. Abundant Alkali-Sensitive Sites in DNA of Human and Mouse Sperm . . . . . .

Jamie M. Gossels and Vernon M. Ingram. A Tubulin Identified by a Monoclonal Antibody Is Not Present in Mitotic Spindles . . . . . .

Michael S. Simonson, Lloyd A. Culp, and Michael J. Dunn. Rat Mesangial Cell–Matrix Interactions in Culture . . . . . .

John K. Chesters, Linda Petrie, and Hazel Vint. Specificity and Timing of the Zn^{2+} Requirement for DNA Synthesis by 3T3 Cells . .

SHORT NOTES

David C. Spray, Lucy Cherbas, Peter Cherbas, E. A. Morales, and Grant M. Carrow. Ionic Coupling and Mitotic Synchrony of Siblings in a *Drosophila* Cell Line . . . . . .

I. Hammel, D. Lagunoff, and P.-G. Krüger. Recovery of Rat Mast Cells after Secretion: A Morphometric Study . . . . . .

Hiroaki Suzuki, Hisakazu Fujita, Yoshifumi Ogiso, Atsushi Oda, Noboru Kuzumaki, and Junichi Uchino. Reduced Induction of c-*fos* but Not of c-*myc* Expressions in a Nontumorigenic Revertant R1 of EJ-*ras*-Transformed NIH/3T3 Cells Treated with 12-*o*-Tetradecanoylphorbol-13-acetate (TPA) . . . . . .

Anna L. Kiss and P. Rohlich. Effect of Acidic Extracellular pH on the Receptor-Mediated Endocytosis of Peroxidase–Antiperoxidase (PAP) Immune Complex in Rat Peritoneal Macrophages . . . . . .

Vincenzo Giancotti, Emanuele Buratti, Laura Perissin, Sonia Zorzet, Alan Balmain, Giuseppe Portella, Alfredo Fusco, and Graham

Printed in Uppsala, Sweden 1989 by Almqvist & Wiksell Tryckeri

H. Goodwin. Analysis of the HMGI Nuclear-Proteins in Mouse Neoplastic Cells Induced by Different Procedures 538
Wolfgang Holter, C. Michael Fordis, and Bruce H. Howard. Efficient Gene Transfer by Sequential Treatment of Mammalian Cells with DEAE-Dextran and Deoxyribonucleic Acid . . 546
Robert L. Ochs and Karel Smetana. Fibrillar Center Distribution in Nucleoli of PHA-Stimulated Human Lymphocytes 552

LETTER TO THE EDITOR

Alan P. Johnstone and Gwyn T. Williams. DNA Breaks in Quiescent Lymphocytes 558
Author Index For Volume 184 560

NOTICE

e Subject Index for Volume 184 will appear in the December 1989 issue as part of a cumulative index for the year 1989.

GENOMICS

International Journal of Gene Mapping and Nucleotide Sequencing
Emphasizing Analyses of the Human and Other Complex Genomes

Editors-in-Chief

Victor A. McKusick
The Johns Hopkins University, Baltimore, Maryland
Frank H. Ruddle
Yale University, New Haven, Connecticut

Genomics highlights the emergence of a new area of scientific inquiry—the comparative analysis of the hierarchical organization and evolution of the human and other complex genomes.

- Provides a common meeting ground for those involved in molecular biology and genetics
- Emphasizes the integration of basic and applied research in human and comparative gene mapping, molecular cloning, large-scale restriction mapping, and DNA sequencing and computational analysis
- Publishes full-length and brief research communications, timely reviews, and editorial commentary
- Promotes efficient communication with the major genetic databases

Volumes 4–5 (1989), 8 issues
ISSN 0888-7543
In the U.S.A. and Canada: $168.00
All other countries: $189.00

Sample copies and privileged personal rates are available upon request.
For more information, please refer to S9024 and write or call:

ACADEMIC PRESS, INC.,
Journal Promotion Department
1250 Sixth Avenue, San Diego, CA 92101, U.S.A. (619) 230-1840

All prices are in U.S. dollars and are subject to change without notice. S9024

The State-of-the-Art PCR Laboratory Manual

PCR PROTOCOLS

A Guide to Methods and Applications

edited by
Michael A. Innis, David H. Gelfand,
John J. Sninsky, and Thomas J. White

The broad utility of the polymerase chain reaction method is now within reach of every researcher. Designed for use at the laboratory bench, this is the most comprehensive manual on PCR available today. Over 50 chapters provide precise instructions on procedures, with advice on primer design. All of the techniques described, from amplification and direct sequencing of genomic DNA through cDNA cloning and quantitation of mRNA, are tested, current, and supplemented with helpful notes and illustrations.

You'll also learn how to:

- Optimize novel applications
- Avoid many cumbersome molecular biological techniques
- Set up the laboratory to avoid contamination.

Affordable, well written, and self-contained—all biological scientists using PCR will find this spiralbound volume indispensable.

Spiralbound: $39.95 (tentative)
ISBN: 0-12-372181-4
Casebound: $69.50 (tentative)
ISBN: 0-12-372180-6
July 1989, c. 320 pages

Topics covered in full detail:

BASIC METHODOLOGY

- ▼ Amplification of Genomic DNA Targets
- ▼ Optimization of PCR Reaction and Design of Primers
- ▼ Nonradioactive Detection of PCR Products
- ▼ mRNA Quantitation by PCR
- ▼ Cloning PCR Products
- ▼ Contamination and Product Carryover
- ▼ PCR from Paraffin Sections
- ▼ Amplifying Ancient DNA

RESEARCH APPLICATIONS

- ▼ Direct DNA Sequencing of PCR Products
- ▼ DNA Footprinting
- ▼ Detection of Rare mRNAs
- ▼ Site-Directed Mutagenesis
- ▼ Screening DNA Libraries
- ▼ Amplification of Flanking DNA Sequences

GENETICS AND EVOLUTION

- ▼ Tissue Typing and Disease Susceptibility
- ▼ Haplotype Analysis of Single Cells
- ▼ Population Biology

DIAGNOSTICS AND FORENSICS

- ▼ HIV Detection
- ▼ HTLV I and II Detection
- ▼ Screening for Novel Viruses
- ▼ Detection of Oncogenic Mutations
- ▼ PCR in the Diagnostics of Retinoblastoma

INSTRUMENTS AND SUPPLIES

- ▼ PCR in a Teacup
- ▼ Low-Cost Air-Driven Cycling Oven
- ▼ Basic Equipment and Supplies for the PCR Lab

ACADEMIC PRESS
Harcourt Brace Jovanovich, Publishers
Book Marketing Department #29059, 1250 Sixth Avenue, San Diego, CA 92101

© 1989 by Academic Press, Inc. All Rights Reserved.

CALL TOLL FREE 1-800-321-5068

Prices subject to change without notice. MC/ES #29